Introduction

- **sequence** - a database object generating a sequence of numbers (1, 2, 3, …)
  - the initial value and step can be set
  - sequence upon request returns next value from defined number sequence
- usage depends on the particular application:
  - generating identifiers for an artifical primary key
  - storing order of inserted records
  - …

Auto-incrementation of the column

- automatically set value of column to new and unique value generated by the use of a sequence
- value returned by a sequence is only a number
  - after inserting values into record the value does not change (it is not part of sequence, e.g.: after deleting of row, values in other rows does not change)
- some databases have syntactic support for auto-increment
  - e.g.: `AUTO_INCREMENT` in MySQL
  - Oracle from version 12c `IDENTITY`

Creating and removing sequence

- sequence is a database object similar to a table
- creating of sequence (syntax):

```
CREATE SEQUENCE name
    START WITH start_number
    INCREMENT BY increment_value;
```

- removing of sequence (syntax):

```
DROP SEQUENCE name;
```

Usage of sequence

- two possible usage:
  - getting actual/current value (last generated)
    (syntax: `sequence.currval`)
  - getting next value
    (syntax: `sequence.nextval`)
- example:
  ```
  INSERT INTO student VALUES
      (seq_student.nextval,
      'Janko', 'Hraško');
  SELECT seq_student.currval
      FROM dual;
  ```

Auto-increment column in Oracle I.

- creation process:
  1. creation of table
  2. creation of sequence
  3. creation of trigger
- usage - instead of
```
INSERT INTO
student (id,name,surname)
VALUES (17,'Jan','Holly')
```
we can use
```
INSERT INTO
student (name,surname)
VALUES ('Jan', 'Holly')
```

Auto-increment column in Oracle II.

```sql
DROP TABLE student;
CREATE TABLE student (
    id INT NOT NULL PRIMARY KEY,
    name VARCHAR2(50),
    surname VARCHAR2(50)
);

DROP SEQUENCE student_pk_seq;
CREATE SEQUENCE student_pk_seq;
```

Auto-increment column in Oracle III.

```sql
CREATE OR REPLACE TRIGGER
          auto_inc_student_pk
  BEFORE INSERT ON student
  FOR EACH ROW
  BEGIN
    SELECT student_pk_seq.nextval
    INTO :NEW.id
    FROM dual;
  END;
  /
```

Questions?